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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/365,697 08/02/99 GENDELMAN

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MMC2/0829

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EXAMINER

TAYLOR, V

ART UNIT

PAPER NUMBER

2862

DATE MAILED:

08/29/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/365,697

Applicant(s)

GENDELMAN ET AL.

Examiner

Victor J Taylor

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: *Office Action*.

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DETAILED ACTION

Drawings

1. New formal drawings are required in this application. The drawings are objected to by the drafts person under 37 CFR 1.84 or 37 CFR 1.152 on USPTO form 948 dated 2 August 1999 attached to paper 2. Corrections are required upon allowance of the claims.

Specification

2. The disclosure is objected to because of the following informalities:
- a. The title of the invention is missing from the first page of the specification.
 - b. The section in the specification concerning the Field of the Invention, which includes the heading and the description is missing in the specification on page 1.
 - c. The detailed description of the drawings is missing the title starting with figure 1 on page 11.
 - d. The detailed description of the preferred embodiments is combined with the description of the drawings and contains an improper title on page 6.
 - e. The specification is in improper format under 37 CFR 1.52(b) and 1.75(h). The sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch),

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and a bottom margin of at least 2.0 cm. (3/4 inch). See 37 CFR 1.84 for drawings. The specification appears to be a photo copy of a previous work with the margins out of required limits as required by the printer. Corrections are required.

f. The applicant is required to review the specification and correct the numerous errors. Appropriate correction is required.

3. The attempt to incorporate subject matter into this application by reference to:

The Soviet Union Author's Certificate 949574 in line 4 on page 2 of the specification, and to the method of vibroseis seismic prospecting with three component receivers and mathematical prospecting, as described in the Russian Patent 2045079 and found in lines 10-15 of page 2 in the specification is improper, because these steps of cited prior art in the specification contain elements of the claimed invention and no copies of the cited art were provided by the applicant. A properly executed IDS statement with copies of the cited prior art is required.

Information Disclosure Statement

4. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

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Claim Rejections - 35 U.S.C. § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The steps of mathematically processing the so call “active” variant is not defined in the specifications or as found in lines 3-17 on page 7. The steps and formulation or equations for mathematically processing the data in not defined in line 9 on page 7 or elsewhere in the specification. The support in the specification for the claimed invention is indefinite as to just how these steps of mathematically equation processing of received micro seismic noise data with a filter window of 2-5 Hz. “The passive variant”, is processed with the standard seismic data using a standard seismic source “the active variant” to produce the map of the oil field.

Claim Rejections - 35 U.S.C. § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Handley et al., in US 4,926,392 in view Hirokazu Moriya et al. The Precise detection of a P-wave in low S/N signal by using time frequency representations of a triaxial hodogram published in Geophysics, Volume 61, # 5 (September-October 1996), pages 1453-1466 with 15 figures.

With regard to claim 1, 4, 9, 12, 17, and 21, Handley et al., discloses the common limitations in claim 1, that of placing at least one receiver 4, of seismic vibrations 2, capable of recording 10, at least one data component within a 2 to 5 Hz frequency range over an expected hydrocarbon deposit onshore in the selected area 10, see figure 1 and;

further teaches the limitation of registering the spectral characteristics of the seismic noise of the earth 4, within 2 to 5 Hz at least one point 4, on the selected area as passive information signal 6 see figure 1 and;

Hadley further discloses the additional limitation found in claim 4, that of generating seismic vibrations 2, using a vibrator in figure 1, and further discloses registering the spectral characteristics of the seismic noise of the Earth within a 2 to 5 Hz frequency range at points 4 in the selected area 6, before the generating of the seismic vibrations 2 in figure 1, and discloses a passive information signal 8, see the reflected passive signal 8, and the active sweep signal 2, in figure 20-A, and during the generating of the seismic vibrations 2 in figure 1, as an active information signal 8 in figure 1;

Hadley further teaches the additional limitation in claim 9 as the method for detection of hydrocarbon deposits offshore as the seismic prospecting equipment at a theoretical location on

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the surface of the earth to include both terrestrial as well marine as well known in the art and found in line 35 of column 7.

Hadley further teaches the additional limitation in claim 12 of generating seismic vibrations as the seismic vibrations source 2 in figure 1, and in line 39 of column 7. Hadley further discloses the additional limitation of registering at least once the spectral characteristics of the seismic noise of the Earth as the sweep and reflected signal recorded in 2 of figure 20-A, within a 2 to 5 Hz frequency range, see the sweep frequency of the source 2 in figure 1, at least one point on the bottom before the generating of the seismic vibrations 2 in figure 1, and as a passive information signal and during the generating of the seismic vibrations as an active information signal 2 in figure 1.

Hadley further teaches the additional limitation of claim 17, that of periodically recording 10 in figure 1 as an information signal, the spectral characteristics of the seismic noise of the Earth within 2 to 5 Hz at the control points 4 in figure 1, and the receivers 4 in figure 1; and teaches detecting an edge of the hydrocarbon deposit 6 in figure 1, at a control point at which a spectral anomaly relative to a spectrum from an area known not to contain hydrocarbons disappears 8 in figure 1.

Hadley further teaches the additional limitation of claim 21 of periodically recording as an information signal the spectral characteristics of seismic noise of the Earth within 2 to 5 Hz at each control station in the processing and recording of seismic signals in 10 in figure 1; and

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Hadley further discloses the additional limitation of measuring an absence of a spectral anomaly relative to a spectrum recorded outside of the boundary 6 in figure 1

Handley et al., does not disclose the limitation of measuring the presence of a spectral anomaly on a spectrum of the passive information signal relative to a spectrum of an information signal from an area known not to contain hydrocarbon deposits.

Hirokazu, Moriya et al., discloses a signal processing technique for three component micro seismic data that allows the precise determination of P wave arrival times with a cross correlation coefficient derived through the eigen value analysis of the spectral matrix in figure 1 and discloses cross correlation and the design of the directional filter in equation 4 and in column 1455, and discloses the window centering as a function of Cr on page 1456 and discloses application of field data in a geothermal field on page 1460 and discloses the distributions of processed micro seismic data on page 1464. Hirokazu, Moriya does not disclose the seismic receiver array and the swept signal vibriosis source commonly found in the seismic arts for terrestrial and marine environments. He does disclose seismology and multi component seismic measurements in column 1 page 1453.

It would have been obvious to one skilled in the seismic arts at the time the invention was made to include the precise detection and processing technique for micro seismic data of Hirokazu, M. Et al., into the method and apparatus for obtaining seismic vibratory reflective data computer processing invention of Handley et al., to improve with the processing of micro seismic

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data and provide for the improved imaging of oil lithology and to reduce cost by the improved processing using the triaxial hodogram matrix and disclosed equations.

As to claim 2, Hadley further teaches the limitation of the passive information signal, (see the reflective signal from the geological lithograph in figure 1.) is recorded 4 from a continuous source vibrator 2, including variable and indefinite time periods of up to 60 minutes in line 33 of column 7.

As to claim 3, 7, 8, 11, 14, and 15, Hadley further teaches the limitation of a plurality of two receivers 4 in figure 1, of the seismic vibrations 2 are used and placed at a distance to each other as the spacing of the receivers 4 in figure 1. It is well know in the seismic arts to space the receivers at various chosen distances to comply with design parameters of the survey and the spacing of receivers in seismic arrays of up to 500 meters is designers choice and well known in the seismic recording arts.

As to claim 5, 10, 13, 18, and 22, Hadley further does not teach the exact limitation of the passive information signal is recorded for up to 20 minutes, or at least 40 minutes, or at least 10 minutes, or in the range of 40 to 60 minutes. Hadley does discloses a seismic sweep vibrator 2, sweeping over a variable period and recording seismic data during that period of 12 seconds in line 43 of column 7 and records seismic data as a function of, $a(t)$ in combination with the equations in column 8 . It is further well known in the seismic data recording to set the recording period to processing criteria meeting the recording time length requirements and is variable.

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As to claim 6, 20, and 23, Hadley further teaches the limitation of generation of seismic vibrations 2, is for at least 3 minutes as the continuous source vibrator in line 34 of column 7.

As to claim 16, Hadley further teaches the limitation of the generation of seismic vibrations 2 in figure 1, is for at least 5 minutes, and discloses the continuous source vibration 2, with an indefinite time period in line 33 of column 7.

As to claim 19, Hadley further teaches the limitation of the information signal is recorded before and during the generation of seismic vibrations as found in the recording geophones 4, and vibrator 2, combined with the recording interfaces in lines 47-52 of column 7.

As to claim 24, Hadley further teaches the limitation of the information signal is recorded 4, before and during the generation 2, of the seismic vibrations in line 45-50 of column 7.

Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant; McCormack et al., US 5,181,171 is cited for the Adaptive network for picking refractive events and the generalized delta rule.

Marfurt et al., US 5,930,730 is cited for the seismic signal processing and exploration.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor Taylor whose telephone number is (703) 305-4470. The examiner can be reached on work days, Monday to Friday, from 8:30 AM to 4:30 PM. If attempts to reach

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the examiner by telephone are unsuccessful, the examiner's supervisor, the SPE can be reached on (703) 305-4908. The fax phone number for the organization where this application is assigned is (703) 308-7722, and 308-7724. Any inquiry of a general nature relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

VICTOR J. TAYLOR
PATENT EXAMINER

Victor J. Taylor


8/20/2001

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